Framework Stewardship

for the

Idaho Spatial Data Infrastructure

Version 0.1

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Under the auspices of the

Idaho Geospatial Council and
Idaho Technology Resource Management Council

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1.0 Overview

1.1 Background

Geographic information is essential for decision making at all levels of government and economic sectors. Many Idaho agencies are using Geographic Information Systems (GIS) as the principal analytic and spatial data management tool for a wide range of programs and issues that include emergency management, infrastructure planning and management, natural resource management, social services allocation and management, and revenue management. The lifeblood of these systems is spatially referenced data, which are expensive to collect and form into spatial datasets of documented quality, accuracy, currency and completeness. Too often, spatial data are created and stored without providing on-going resources for their maintenance, distribution, long-term management and retirement (as appropriate). All too often the result is periodic re-collection and re-development of the same data at additional expense to taxpayers. Moreover, frequently these data are developed piecemeal for specific projects or programs, which can make integration nearly impossible. All levels of government are experiencing increased expectations for service delivery. In addition, there is a rising need for supporting business purposes that cut across agencies and levels of government. We are formalizing stewardship to help meet these expectations and needs.

1.2 Introduction

Executive Order 2010-____ authorizes the Idaho Geospatial Council (IGC) to coordinate the development, maintenance, access and use of Geographic information in Idaho. IGC's Executive Committee provides strategic planning, budgetary, and policy development, and the Council members provide technical guidance related to the dissemination of GIS technologies across the state enterprise and bring issues and decisions to the Executive Committee. The Idaho Geospatial Office (IGO) assists the Executive Committee in its mission. The Framework Leadership Team (FLT) is responsible for coordinating the development, integration and long-term management of base map data (Framework). Each Framework Technical Working Group is responsible for establishing standards and writing implementation plans for its theme. A single Framework dataset, consisting of features and attributes, is called an element. In Idaho, Framework consists of about 40 elements organized into 14 thematic groups, plus a reference category (similar to a library's reference section). For example, the Transportation theme includes roads, trails, railroads, and airports. IGC coordinates the 14 thematic teams through the Framework Coordinator. Framework, in turn, feeds into the National Spatial Data Infrastructure program led by the Federal Geographic Data Committee (FGDC). Appendix A contains a glossary of terms used in this document. Appendix B contains references and links for further information.

Larry English, a well-known consultant in knowledge management, defines data stewardship as "the willingness to be accountable for a set of business information for the well-being of the larger organization, by operating in service, rather than in control, of those around us." (English, 2006.) The larger organization here is the enterprise of government in Idaho. By extension, it embraces the public, our neighboring state and local governments, and the entire nation.

Full life cycle stewardship is critical to the Framework component of ISDI. The current focus of the Framework TWGs is data development (acquire phase) and access; however, as

development efforts mature, other aspects of the data life cycle will predominate, such as maintenance, evaluation and ongoing quality improvements. See Figure 1, below. In anticipation of this evolution, we have crafted the stewardship approach to manage the entire life cycle of Framework elements—with quality checks built into every phase.
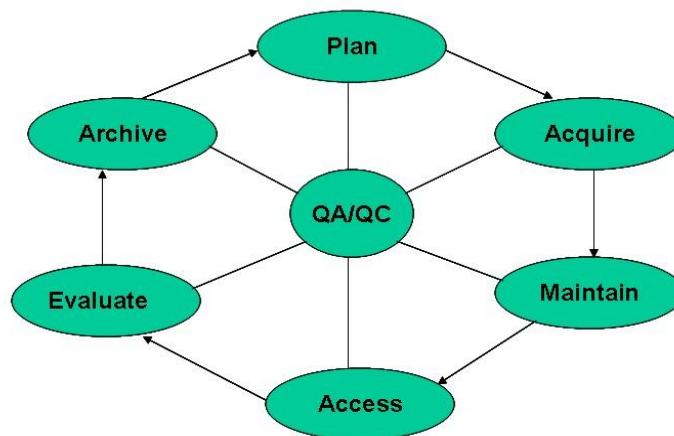

Diagram taken from *Data Management for Data Stewards*, BLM Course Manual, Course No. 0688.

Figure 1. Data Life Cycle

1.3 Purpose and Scope

The purpose of this document is to further describe Framework stewardship for Idaho's Spatial Data Infrastructure as contemplated in the GIS Strategic and Business Plans approved February 2009. Principal roles are Source Steward, Framework Steward and Vertical Steward, guided by the Framework leadership and facilitated by the Framework Coordinator. These roles are described later in this document.

Framework stewardship includes the following essentials:

- Steward group lead (usually the Framework steward) for each element;
- Accountability through a stewardship charter for each steward group; and
- Planning that addresses the data lifecycle and for horizontal and vertical integration.

2.0 Framework Stewardship

To preserve and enhance the substantial investment made in collecting spatial data and to facilitate its use, Framework stewardship provides the procedures and architecture through which multi-jurisdictional data development, maintenance, and distribution activities occur consistently and appropriately and in a way that continuously supports multiple agency activities. In 2009, the Idaho Geospatial Committee completed GIS Strategic and Business Plans that provide the overall goals and objectives guiding ISDI development. Framework Stewardship is based on the principles and best practices set forth in Geographic Data Stewardship Best Practices, which is part of Oregon's GIS utility business case and incorporated into Idaho's plans.

2.1 Basic Organizational Roles

Some organizational components are required to facilitate and manage stewardship activities. The following paragraphs refer to Figure 2, below.
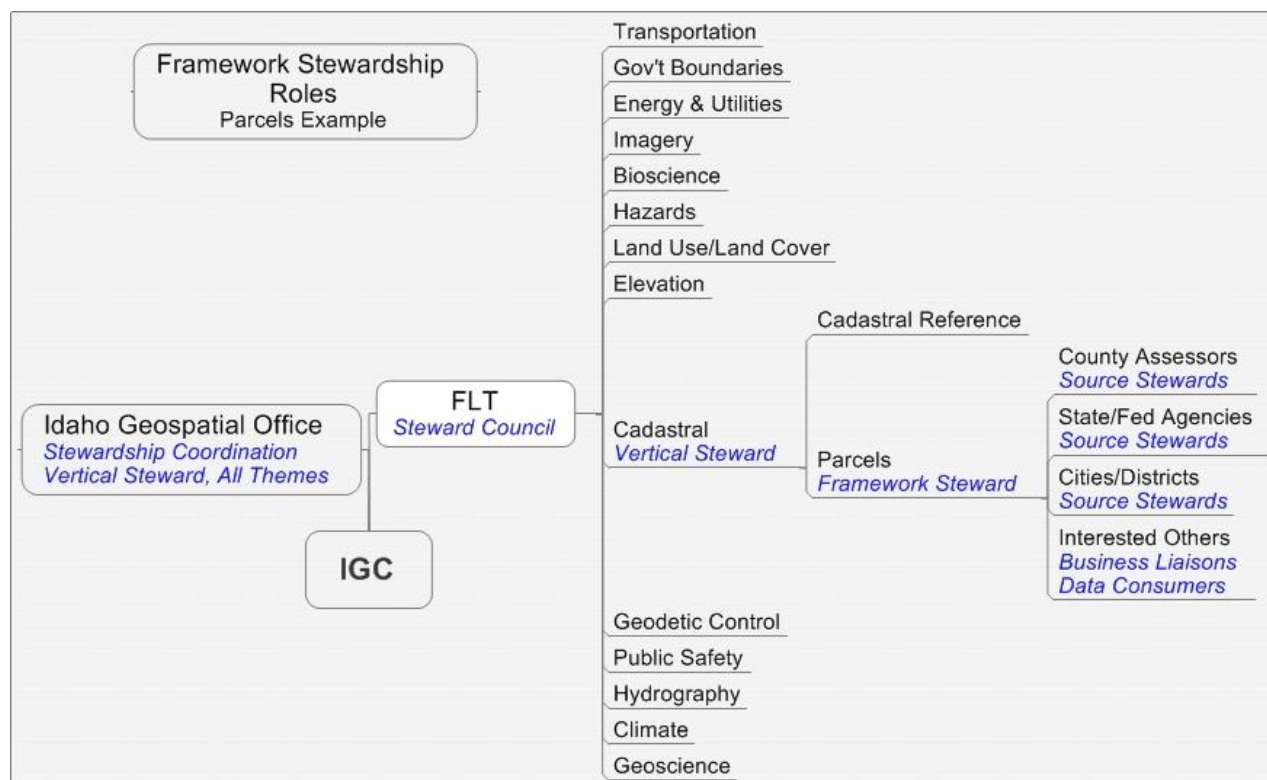

Figure 2. Stewardship Roles and Relationships

2.1.1 Governance

IGC Executive Committee serves as the governing body for all of ISDI, including Framework stewardship. IGC Executive Committee's role includes approval of stewardship documents, endorsing data standards, and promoting and facilitating data sharing.

2.1.2 Stewardship Coordination

IGO facilitates Framework stewardship in general and facilitates stewardship education, tracks stewardship charters and plans, brings issues to FLT when appropriate, and suggests modifications to the model documents. The Framework Coordinator serves as a central point of contact for stewardship issues that are not specific to a particular Framework element.

2.1.3 Source Stewards

Source stewards create the data at the local level and thus are the best source of Framework data for any particular locale. In most cases, they develop and maintain the data as part of meeting their agency mission. Most Framework elements will involve more than one source steward, such as the 44 assessors responsible for mapping parcels within their county. Source stewards will make up the majority of the steward group membership (see below) and are

accountable for the data contributed through the stewardship charter and the custodians thereof (Idaho Code Section 9-337(3)).

2.1.4 Framework Stewards

In cases where data are contributed by more than one source steward, horizontal integration is required to transform the contributions into Framework. This is the primary work of the Framework steward. Typically, the Framework steward is a central point of contact for the Framework element and acts as a coordinator for the steward group. Framework stewards are in regular contact with the appropriate Framework TWG Chair and communicate periodically with the Framework Coordinator to relay information and suggestions for improving stewardship implementation.

Objectives of Framework stewards are:

- To maintain a statewide perspective for the development and maintenance of the element
- To develop efficient and friendly methods for data maintenance
- To develop efficient methods and tools for integrating data
- To improve the usability, appropriate accessibility and quality of the element
- To assure the consistent use and interpretation of applicable standards by source
- stewards and others
- To facilitate the development of metadata by source stewards,
- To provide a certain level of technical support to the user community, and
- To ensure that any applicable data sharing agreements are in place and in compliance.

2.1.5 Vertical Stewards

Vertical stewards assure that two or more Framework elements can be used together easily. Spatial registration verifies that features of one element (like roads) are in proper relationship to features in other elements (like bridges and rivers). Since there are many possible combinations, a variety of strategies will be used to shape data development efforts for concurrent use. The Framework TWG Chairs will monitor and guide vertical integration of elements within their respective themes, with guidance from the Framework Coordinator. Working together as the Steward Council, the FLT will monitor and guide the vertical integration of elements between themes, such as hydrography and transportation.

2.1.6 Steward Groups

Steward groups consist of all the stewards contributing data or services to the Framework element. The vision, scope, roles, and business rules will be set forth in a stewardship charter signed by all relevant organizations. The initial task is to write and adopt the charter. The stewardship plan addresses all phases of the data lifecycle. Writing a stewardship plan is the second task. Thereafter, the steward group will carry out comprehensive data management strategies and procedures pursuant to the plan. Steward group members will develop procedures for data management, resolve technical issues and generally communicate on issues and solutions. Steward groups may identify and champion modifications or extensions to an existing standard in order to enhance any aspect of its stewardship responsibilities. To assure alignment with business needs, the steward group will remain in regular contact with

business purpose experts. Figure 3 depicts an example of steward group. Shading indicates the steward group members.
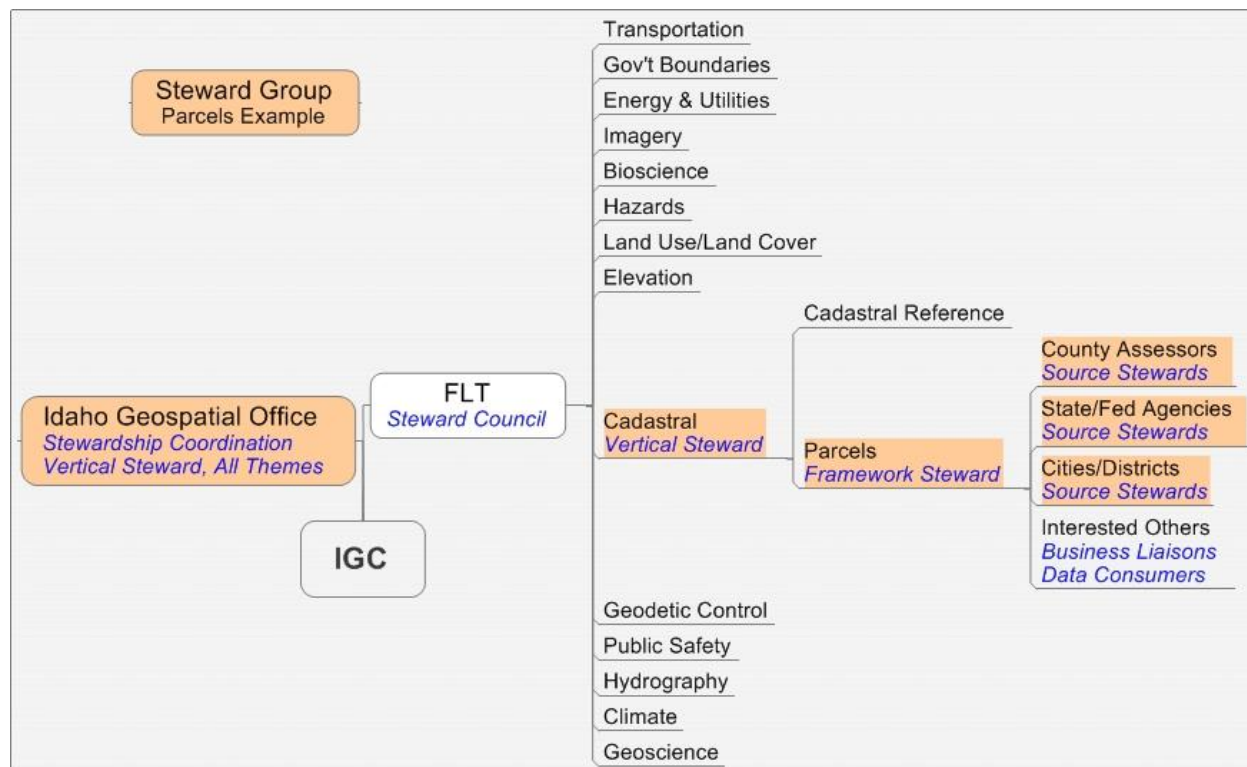

Figure 3. Steward Group Example

2.1.7 Steward Council
The FLT will function as the steward council and have responsibility for developing approaches and guidelines that promote the horizontal and vertical integration of Framework data. The FLT will also help identify vertical and horizontal stewardship issues, act as a primary resource for stewards, and accumulate and exchange information about issues and solutions relating to Framework stewardship and data integration.

2.2 Additional Roles
The specific needs of each Framework element may suggest additional roles necessary for its successful management over the long term. Each steward group will make that determination. Additional roles might include establishing subtypes of source stewards and establishing intermediate or regional steward roles to gather and bundle data prior to making available to the Framework steward. Variations in terminology to describe the basic roles are also acceptable. It is important to clearly link the variant name to the basic role from which it arises.

3.0 Stewardship Context
Framework stewardship exists within a larger context and will benefit from efforts in other arenas. The primary challenges to effective and perpetual stewardship are briefly identified in Section 3.2.

3.1 Guidance

The FLT will guide Framework stewardship based on this document, stewardship plans and evolving best practices. Additional guidance will include:

- approaches for complying with business rules and standards
- procedures for certifying that data submitted by custodial stewards meets the particular
- acceptance criteria appropriate to it
- model documents and assistance to steward groups
- strategies for addressing privacy and security concerns
- strategies for resolving vertical integration issues, and
- organizational structure and communications plan.

3.2 Challenges

Implementing stable Framework stewardship will involve resolving several challenges.

3.2.1 Funding

In order to facilitate the orderly development and maintenance of Framework elements by many contributors, it is essential to develop a mechanism that promotes sustainable funding in a collaborative context.

3.2.2 Data Integration

Seamless statewide data is the objective of horizontal integration. In many cases, this represents a long-term, iterative process. Appropriate stewardship structure, adoption of and adherence to standards, phased implementation, and incorporating lessons from similar efforts will facilitate this process. To achieve the vision of seamless integration, where multiple custodial stewards contribute chunks of data to form a single Framework element, the steward group will develop an integration plan as a component of the stewardship plan.

Vertical integration assures the frictionless use of Framework datasets together. The data integration plan will address vertical integration issues particular to the element in keeping with the overall strategy developed by the FLT.

3.2.3 Managing Liability

Liability issues are a concern when creating an integrated dataset compiled from a variety of sources and when that composite dataset is then made available for unrestricted public use. A comprehensive solution will be developed under the guidance of IGC and the Idaho Legislature in order to address liability and related issues. In the meantime, standard disclaimers and appropriate use statements for spatial data will be developed and adopted in Idaho. More restrictive language to address particular situations may need to be included in the stewardship plan and in the metadata that accompanies each element.

3.2.4 Standards

Each steward group will promote the use of and adherence to the applicable standards for their Framework element. Input regarding changes, additions and deletions will be forwarded to the appropriate Framework theme for consideration. Guidance for updating standards is available on the standards Web page (see Appendix B).

3.2.5 Distribution and Access

Currently, the Idaho geospatial data clearinghouse, INSIDE Idaho, hosts some Framework data. ISDI includes establishing a network of distributed sites to host Framework data and serve it through the INSIDE Idaho portal. The appropriate steward groups and FLT will make decisions about hosting and distribution-related issues. At a minimum, metadata, as well as a hyperlink to the data storage/distribution URL, will be available.

3.2.6 Institutionalizing Stewardship

For the most part, duties and responsibilities required for Framework stewardship will be performed by personnel employed by individual agencies. In many cases, these activities will extend beyond the needs of the agency. Therefore, incorporating stewardship into agency planning and budgeting, and incorporating stewardship responsibilities into position descriptions for Framework stewards are necessary steps to achieving long-term stability for Framework and realizing its enterprise benefits.

3.3 Documents

To facilitate the orderly and accountable conduct of stewardship through the entire data life cycle, the following documents are required for most Framework elements or a closely related cluster of elements being handled together:

    1) Stewardship Charter
    2) Stewardship Plan

Selected elements will also require:

    3) Standard Operating Procedures
    4) Business Rules.

Models or examples of these documents will be available as part of the resources provided by the FLT.

Appendix A
Glossary
(Adapted from Parts 0 and 5 of the
Geographic Information Framework Data Content Standard)

<u>Term</u>	<u>Definition</u>
Accuracy	**Absolute** - A measure of the location of individual features on a map when compared to their true position on the face of the earth. **Relative** - A measure of the location of individual features on a map when compared to other features on the same map.
Attribute	Characteristic of **features**.
Source Steward	Agency or organization that is the source of part or all of a **Framework element**. Source stewards are responsible for tasks relating to maintaining and documenting source data and providing it to a **Framework steward** for quality checking and, if applicable, integration.
Element	A single **Framework** dataset, consisting of **features** and **attributes**.
Element Workgroup	A subgroup of a **Framework theme** responsible for developing a single **element** or closely related cluster of **elements**. Most participants in the **element workgroup** will be members of the **steward group** as well.
Feature	Abstraction (point, line or polygon) of a real world phenomenon (such as a domestic well, a road centerline, or a county boundary) that is stored in a spatially enabled database.
FLT	Framework Leadership Team, consisting of a Chair (Framework Coordinator) and the leads of each of the themes and reference category; responsible for guiding **Framework** stewardship.
Framework	Statewide, seamless, current, accessible geospatial data. In Idaho, Framework includes over 30 datasets organized in 14 themes and a reference category. A subset will be incorporated into the **NSDI** and accessed through the National Map.
Framework TWG	Framework Technical Working Group focused on a particular **Framework** theme; subcommittee of the Idaho Geospatial Council Executive Committee.

Framework Coordinator	Person responsible for guiding and assisting **steward groups** in meeting their stewardship responsibilities and providing overall coordination and tracking of the steward network.
FGDC	Federal Geographic Data Committee; responsible for setting national spatial data standards, providing guidance for developing Framework data nationwide, and developing a national portal for accessing Framework data.
IGO	Idaho Geospatial Office, within the Office of the Chief Information Officer, Department of Administration, State of Idaho. Performs statewide GIS coordination and responsible for ISDI management; provides support to IGC.
GIS	Geographic Information System (GIS) is an information system capable of capturing, integrating, storing, editing, analyzing, managing, sharing, and displaying geographic information. A GIS involves computer hardware, software, networks, and applications, as well as the people to operate, develop, administer and use it. Section 67-5779, Idaho Code.
Horizontal Integration	For a given data theme or element, this is the process of piecing together source data from **source stewards** into a format that can populate a statewide dataset.
FLT	Framework Leadership Team, consisting of the Chairs of the **Framework TWGs**, leads of **element workgroups**, and the Framework Coordinator.
Framework Steward	The agency or organization responsible for evaluating and assembling data contributed by **source stewards** into a **Framework element**, coordinating access to it, and facilitating its maintenance. The Framework steward usually coordinates the steward group.
Metadata	Formally structured documentation of digital data products that describes the "who, what, where, when, why, and how" of every aspect of the data it references.
National Map, The	Web-based portal for discovering and accessing **NSDI** data (see below).
NSDI	National Spatial Data Infrastructure. **FGDC** initiative to create and implement a shared data collection and maintenance resource for geospatial datasets nationwide.

IGC

Idaho Geospatial Council, committee of the Idaho Technology Resource Council. The IGC Executive Committee is the governing body for coordinated **GIS** activities in Idaho, as currently defined by Executive Order 2010-_____.

Steward Group

Group comprised of **source stewards**, a **Framework steward** and, sometimes, one or more **vertical stewards**, who contribute data or services to a **Framework element** and is responsible for its entire life cycle.

Steward Council

A body providing support and overall guidance to the steward groups; the **FLT** will act in this capacity.

Theme

Group of **Framework elements**; there are currently 14 themes and a reference category in Idaho's **Framework**.

Vertical Integration

The act of verifying and, if necessary, making adjustments to the spatial registration and data models of multiple **Framework elements** so that they can be used together easily and effectively.

Vertical Steward

The agency or organization responsible for assuring that a particular **Framework element** can be used with other **Framework elements**.

Appendix B
References and Web Links

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    Network, 2006.

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